tested for use in humans. Silver sulfadiazine cream remains the most popular topical agent in use, 0.5 percent silver nitrate solution and mafenide acetate cream being appropriate in special circumstances. Prompt excision and autografting of third-degree burns has been associated with reduction in hospital stay and mortality in several categories of patients, but requires considerable experience to be consistently safe and effective in very large burns. Fresh split-thickness allograft skin remains the best tested autograft substitute, but several artificial skin substitutes have proved useful in special circumstances, and some may prove to have advantages (like the absence of immunologic rejection in scar formation) not present in allograft skin.

Maintenance of body weight and nitrogen balance using enteral nutrition with an unusually high kcal-to-gram nitrogen ratio (about 100:1) is associated with improved survival, at least in children and probably also in adults. Prophylactic intraoperative administration of antibiotics is standard therapy during excision of large burns. Routine use of prophylactic antistreptococcal antibiotics on admission has been questioned, however, though no harm or development of antibiotic-resistant bacteria has been noted.

Finally, while a very promising area of sustained and intensive research, mortality and morbidity due to monocyte, lymphocyte, polymorphonuclear leukocyte or humeral immune abnormalities (or all of these) remain unaltered in large human burns except for nonspecific and indirect measures such as those noted above.

BRUCE E. ZAWACKI, MD

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Ascites and the Peritoneovenous Shunt

ASCITES is an often difficult-to-manage, potentially lethal complication of advanced liver disease. Its precise pathophysiology remains undefined. Increased portal pressure and decreased oncotic pressure allow transudation of lymphatic fluid into the peritoneal cavity, causing ascites. This fluid shift reduces effective plasma volume, which then stimulates the renal renin-angiotensin-aldosterone mechanism to preserve sodium and water. Strict sodium and water restriction, judicious use of loop diuretics and giving aldosterone inhibitors will control ascites in most patients. However, some become totally refractory to such therapy or oliguria, azotemia, encephalopathy or hepatorenal syndrome develops. Previously, treatment of such refractory ascites by paracentesis and ascitic fluid infusion or the use of Holter-type peritoneoatrial shunts resulted in temporary improvement only. Portacaval shunt remained the only effective surgical treatment, presumably acting by reducing portal pressure.

In 1972 LeVeen introduced a one-way, pressure-activated valve or peritoneovenous shunt, which permits continuous infusion of ascitic fluid into the superior vena cava. This valve opens with a pressure gradient of 2 to 4 cm of water. The apparatus can be inserted under local anesthesia. The collection tubing is placed in the peritoneal cavity; the valve is seated under the abdominal wall muscles, and the venous outflow tubing is led subcutaneously and passed through the internal jugular vein into the superior vena cava. Respiration activates the valve. Diaphragmatic descent during inspiration causes a rise in intraperitoneal pressure and a reduction in intrathoracic pressure, resulting in a greater than 4 cm gradient across the valve. The valve then opens, fluid passes from the abdomen to the superior vena cava, blood volume increases and diuresis occurs. If blood volume increase exceeds diuresis, the central venous pressure rises, the gradient drops and flow ceases.

Rapid diuresis with increase in renal blood flow, glomerular filtration and sodium excretion follow successful peritoneovenous shunt insertion. However, complications may occur. Meticulous surgical technique is necessary to avoid ascitic fluid leak, sepsis or immediate mechanical shunt failure. Progressive fibrin deposition may cause delayed shunt failure. About a third of peritoneovenous shunts require revision. Complications from this shunt include pulmonary edema, diffuse intravascular coagulation, superior vena cava thrombosis and bacterial peritonitis. Such complications may require shunt ligation or removal.

Despite these problems, continued experience with this shunt has confirmed its efficacy in selected patients who have cirrhotic ascites, endophlebitis hepatica obliterans (Budd-Chiari syndrome), chylous ascites, pancreatic ascites and malignant, cardiogenic and nutritional ascites. It may be of benefit in some patients with hepatorenal syndrome. Relative contraindications to a peritoneovenous shunt include patients with severe alcoholic hepatitis and jaundice, severe encephalopathy, variceal hemorrhage, acute tubular necrosis, peritoneal sepsis, coagulation disorders and heart failure. Recent technical innovations include the Denver peritoneovenous shunt, which permits various flow rates, and the temporary external Silberman shunt, used in patients with acute ascites.

ALBERT E. YELLIN, MD

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Preoperative Nutrition Therapy

MANY OBSERVATIONS support the concept that poor nutrition has an adverse effect on the postoperative course of surgical patients. In 1936 Studley reported a tenfold increase in postoperative mortality among patients treated for intractable peptic ulcer disease who